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ASSIGNMENT BOOKLET

3216 MATHEMATICS 33 UNIT 3

FOR STUDENT USE ONLY

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1. BEFORE MAILING YOUR ASSIGNMENT BOOKLET PLEASE SEE THAT:

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(3) The booklet cover is filled out and the correct module label is attached.

2. POSTAGE REGULATIONS

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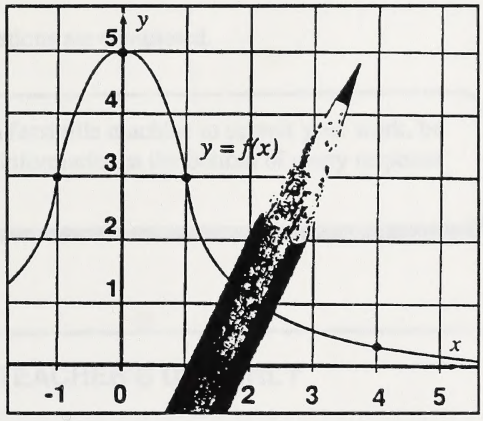
MATHEMATICS 33

Functions and Relations



Unit 3

Assignment Booklet

Distance Learning

Alberta EDUCATION

Mathematics 33
Assignment Booklet
Unit 3
Functions and Relations
Alberta Distance Learning Centre
ISBN No. 0-7741-0140-7

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Your mark on this unit will be determined by how well you answer the questions in this booklet.

Work slowly and carefully. If you are having difficulties, go back and review the appropriate topic.

The three topics that you studied in your unit are covered in this assignment booklet. The total value of these topics is 100 marks. Each topic is divided into several questions. The value of each question is stated in the left margin.

Be sure to proofread each answer carefully.

Do not hand in this booklet until all questions are completed.

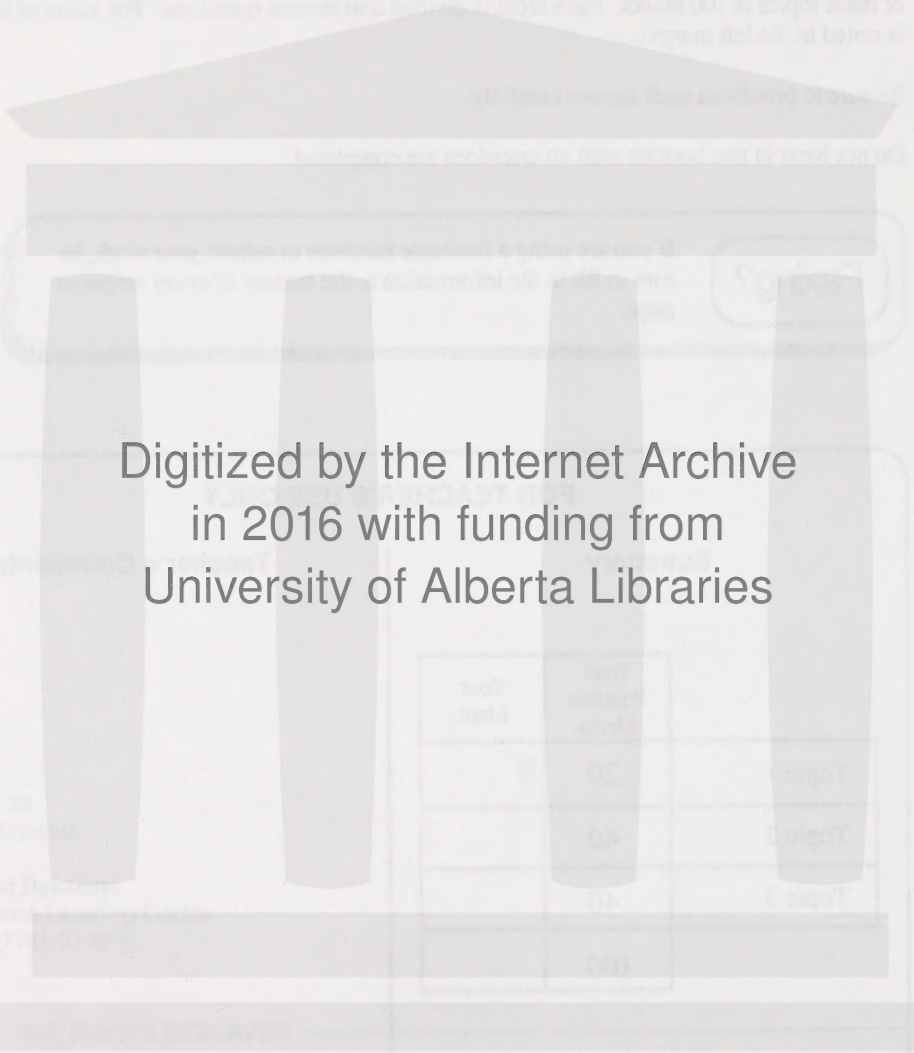
Faxing? If you are using a facsimile machine to submit your work, be sure to fill in the information at the bottom of every response page.

FOR TEACHER'S USE ONLY

Summary

	Total Possible Marks	Your Mark
Topic 1	20	
Topic 2	40	
Topic 3	40	
	100	

Teacher's Comments



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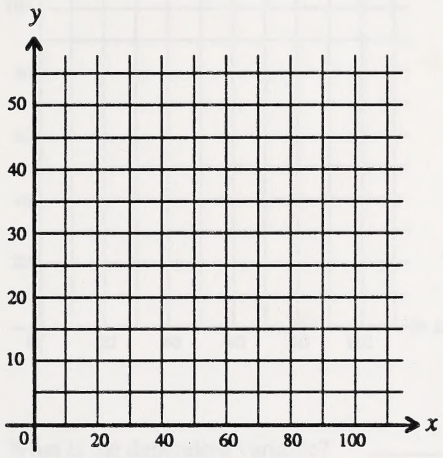
Topic 1: Graphing Relations

1. The total cost to fill up a car with gasoline is related to the number of litres of fuel pumped into the tank at a certain price per litre. Draw the graph to demonstrate this relation for a price of 39.9¢/L. Label the graph correctly and indicate clearly the independent and dependent variables.



(3) a. From the graph determine the cost of 50 L of fuel.

(3) b. From the graph determine the number of litres of fuel you could get for $30.00.

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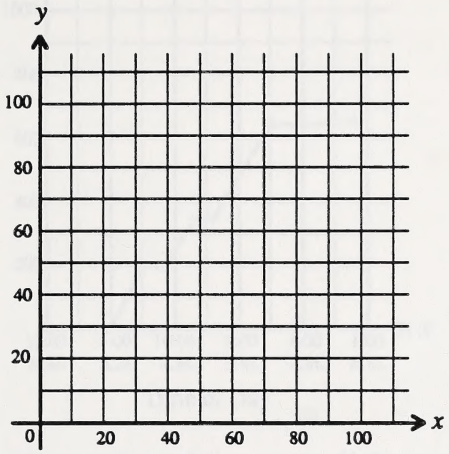
2. A car rental company rents a car for $10 per day plus $0.50 per kilometre driven.

(2) a. Draw the graph of the cost per day versus the number of kilometres driven. Label the graph correctly.



(2) b. What is the dependent variable? _____
What is the independent variable? _____

(2) c. From the graph determine the following:
- the total cost per day when 60 km are driven _____
- the total cost per day when 100 km are driven _____

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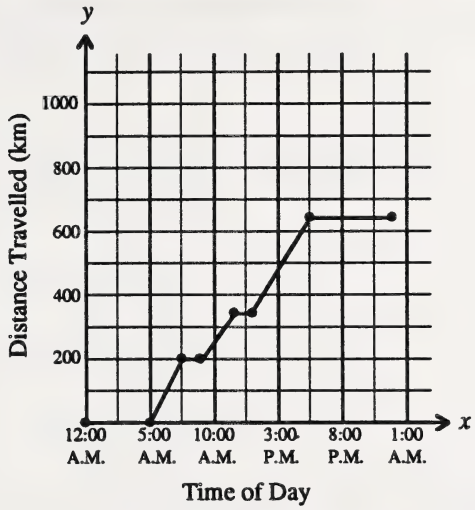
3. The following graph represents one day in a family's trip by car from Edmonton to Jasper and then to Banff.



(2) a. What was the total distance travelled in one day? _____

(2) b. What do the horizontal sections of the graph represent?

_____

(2) c. At what time did they leave Edmonton? _____

(2) d. At what time did they reach Banff? _____

Topic 1

_____ marks

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Topic 2: Functions

(1) 1. Is the following relation a function? _____

$\{(12,1), (13,1), (14,20), (15,20)\}$

2. For the function $y = \frac{3}{x}$, do the following:

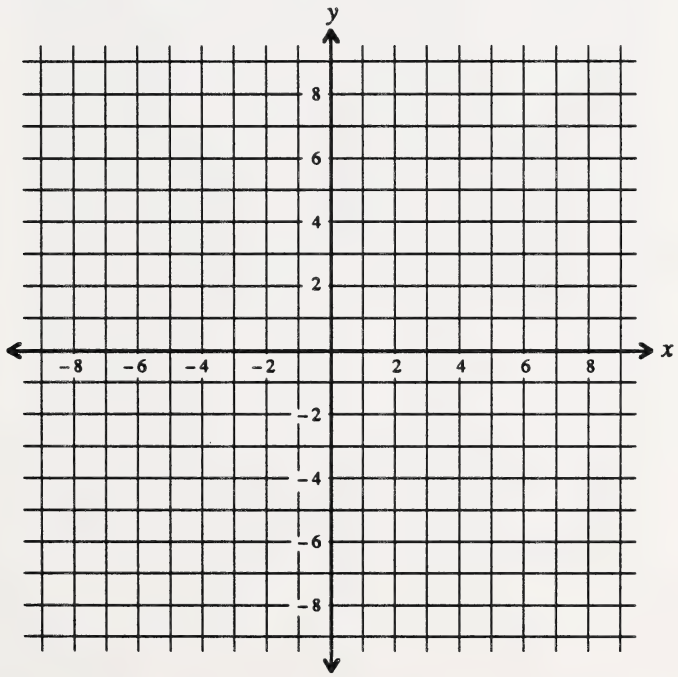
(1) a. State the domain. _____

(1) b. State the range. _____

(4) c. Draw the graph.

Make a table of values.

x	-9	-6	-3	-1	1	3	6	9
y								



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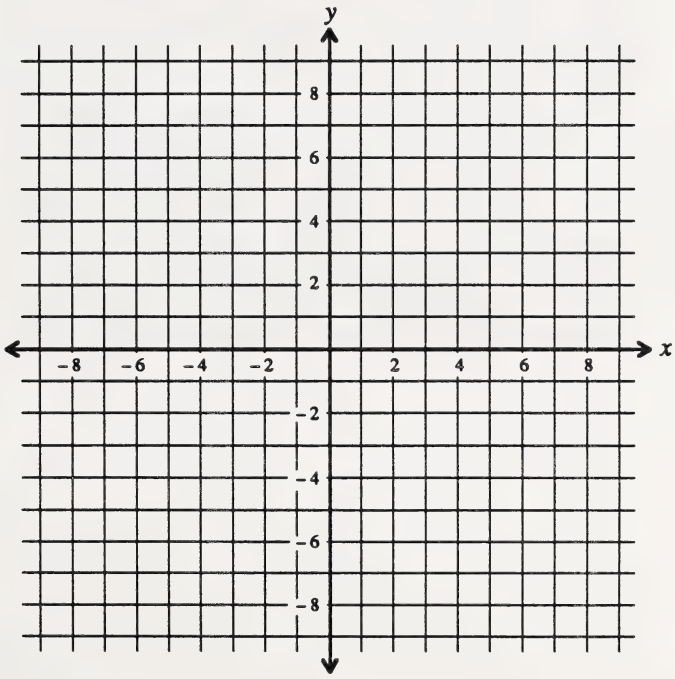
(2) 3. Evaluate $f(x)=6x^3-9x+4$ for $f(3)$.

4. Draw the graphs of the following functions.

(3) a. $y=2x-3$

Make a table of values.

x	-2	-1	0	1	2	3
y						



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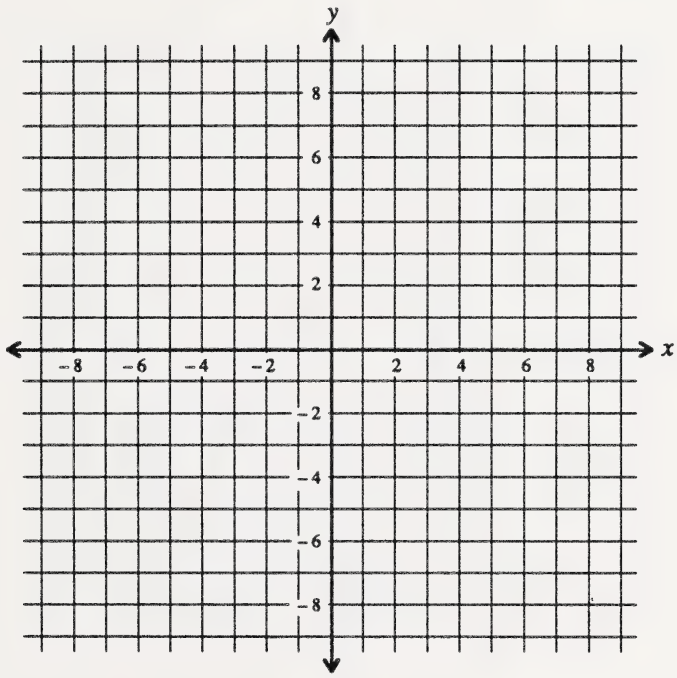
③

b. $y = -\frac{1}{2}x^2 + 5$

Make a table of values.

x	-4	-2	0	2	4	6
y						



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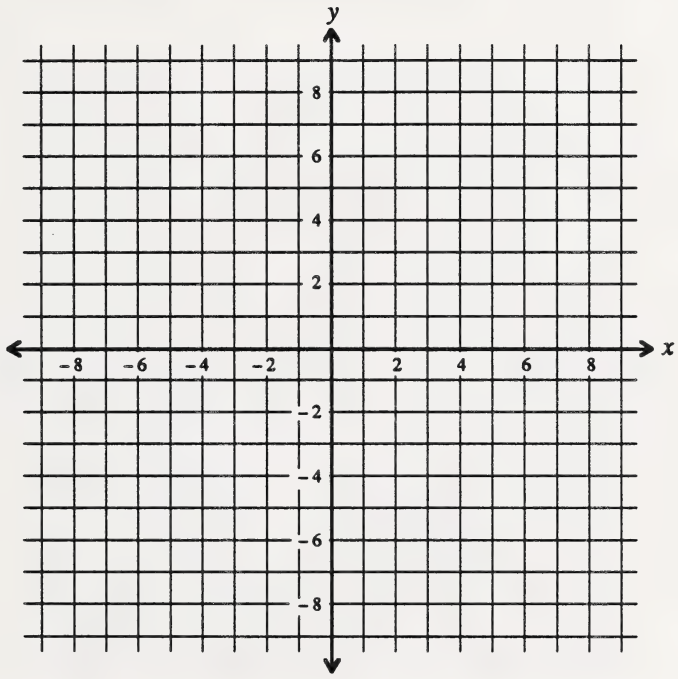
③

c. $y = x^3 - 2x^2 + 3x$

Make a table of values.

x	-2	-1	0	1	2	3
y						



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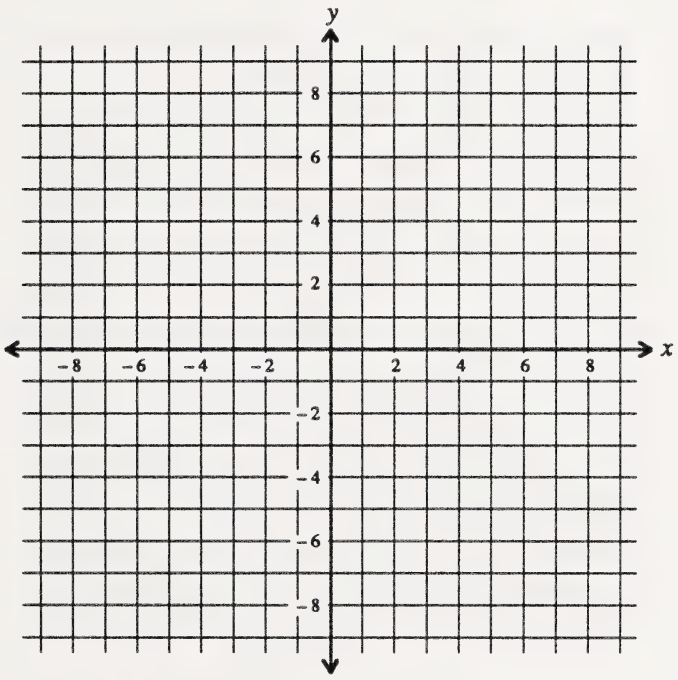
③

d. $y = \frac{2}{x+1}$

Make a table of values.

x	-7	-5	-3	-2	0	1	3	5
y								



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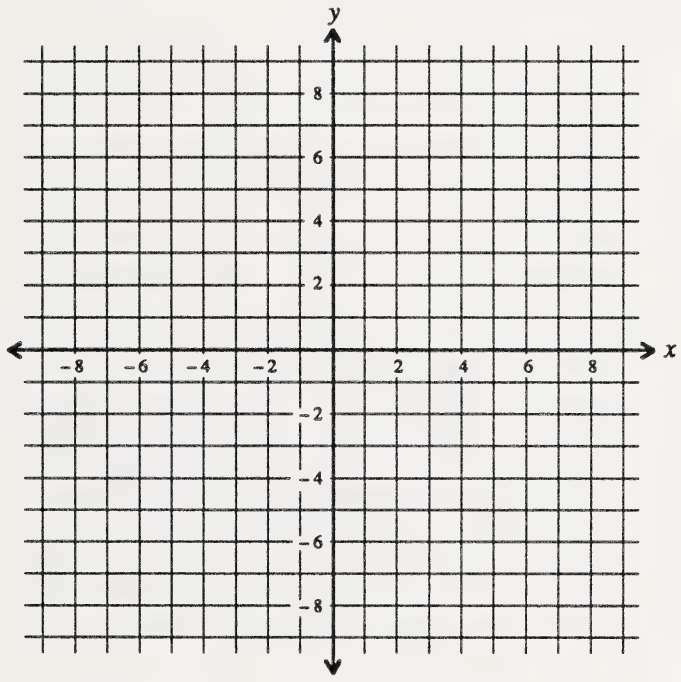
③

e. $y = |x + 3|$

Make a table of values.

x	-6	-5	-4	-3	-2	-1	0	1	2	3
y										



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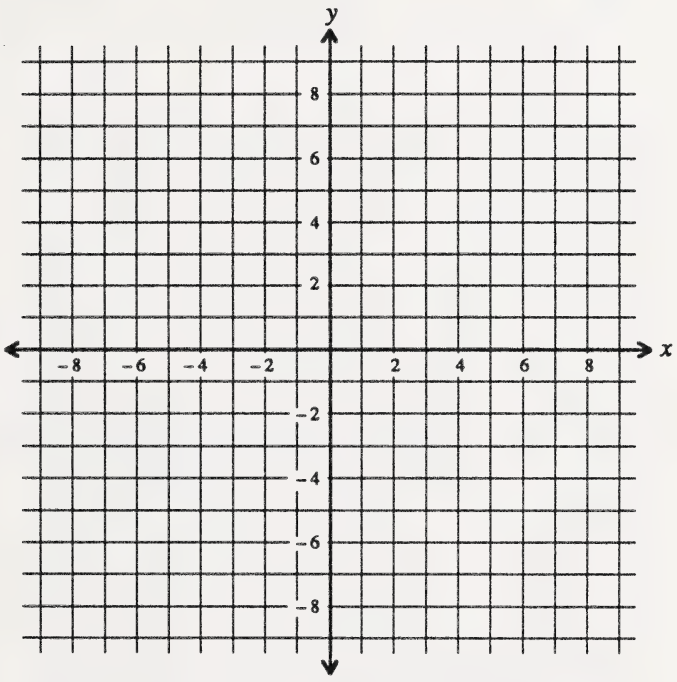
③

f. $y = \sqrt{x} - 2$

Make a table of values.

x	0	1	4	9
y				



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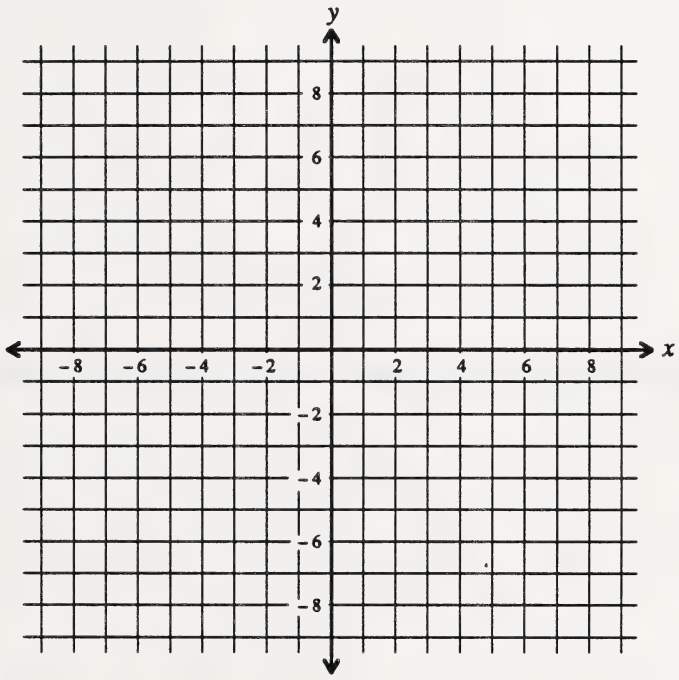
③

g. $y = 3^x - 5$

Make a table of values.

x	-3	-2	-1	0	1	2
y						



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5. The volume of water that can flow through a circular pipe is related to the diameter of the pipe. At a given pressure, this relation is written as

$V = kd^2$, where $k = 50 \text{ kL} / \text{cm}^2$,

$d =$ diameter of pipe in centimetres, and

$V =$ volume of water in kilolitres.

(2) a. What volume of water will flow through a pipe with a diameter of 2 cm?

(2) b. What volume of water will flow through a pipe with a diameter of 4 cm?

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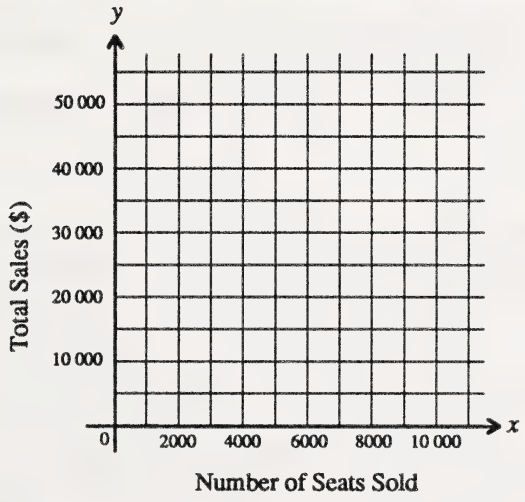
6. There are 8000 seats in a local baseball stadium. Of the 8000, 3000 are gold seats at $5.00 each. The rest are blue seats at $3.50 each. All gold seats must be sold before blue seats can be sold.

(3) a. Draw the graph of the money raised for one game compared to the number of seats sold.



(1) b. How many seats must be sold to cover the operating expenses of $20 000?

_____

(1) c. What is the greatest possible **profit** (after operating expenses) from seat sales for one game?

_____

(1) d. How many seats must be sold to generate a total of $18 000?

_____

Topic 2

_____ marks

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Topic 3: Transformations of Functions

⑥

1. Draw the graph of the function $y=|x|$. On the same grid draw the graph of the function $y=|x+8|-4$. Explain the transformation from $y=|x|$ to $y=|x+8|-4$.

$y=|x|$

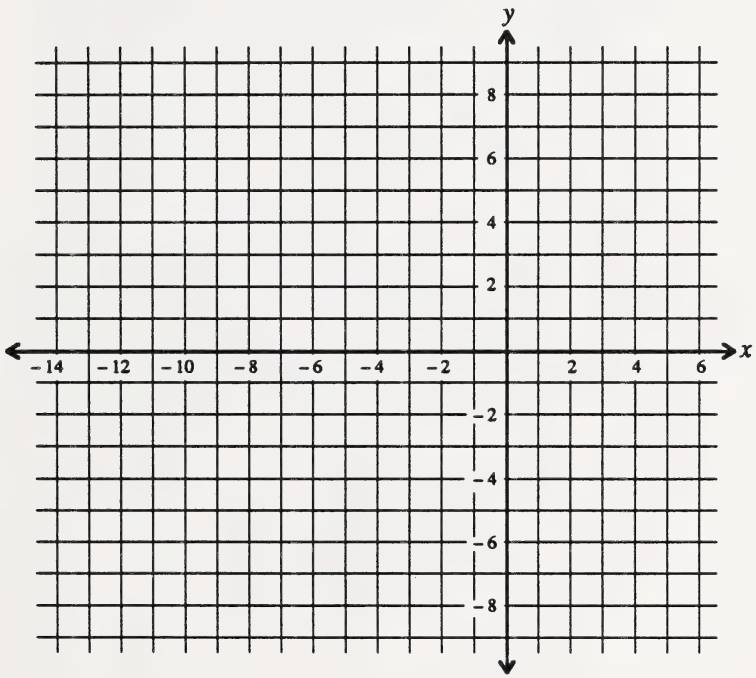
Make a table of values.

x	-2	-1	0	1	2	3
y						

$y=|x+8|-4$

Make a table of values.

x	-14	-12	-10	-8	-6	-4	-2
y							



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⑥

2. Draw the graph of the function $y = x^2$. On the same grid draw the graph of $y = -5x^2 + 4$. Explain the transformation effects.

$y = x^2$

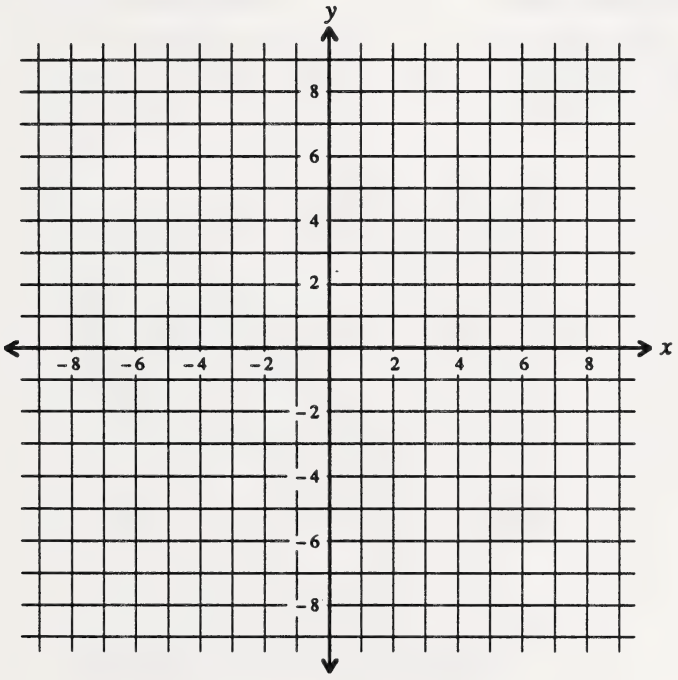
Make a table of values.

x	0	±0.5	±1	±1.5	±2	±2.5
y						

$y = -5x^2 + 4$

Make a table of values.

x	0	±0.5	±1	±1.5	±2	±2.5
y						



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(8)

3. The graph of $y = f(x)$ is shown. Draw the following graphs.

Make a table of values for $y = f(x)$.

x	-1	-2	-3	-4
y				

a. $y = f(x)+4$
Make a table of values.

x	-1	-2	-3	-4
y				

b. $y = f(x)-4$
Make a table of values.

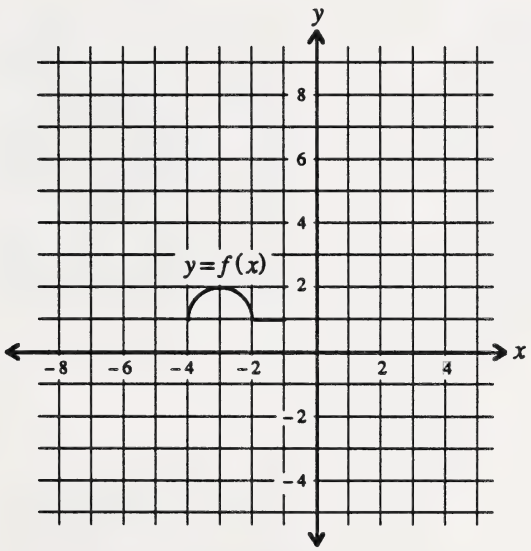
x	-1	-2	-3	-4
y				

c. $y = f(x+4)$
Make a table of values.

x	-5	-6	-7	-8
y				

d. $y = f(x-5)$
Make a table of values.

x	1	2	3	4
y				



(4)

4. Write the new function that describes the transformation of $y = |x| + 2$ moved three units to the right and five units up.

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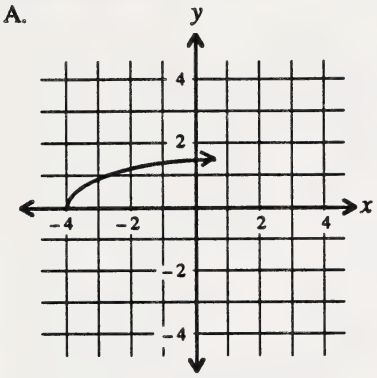
(4)

5. Which of the graphs best represents $y = \sqrt{x-4}$?

A.



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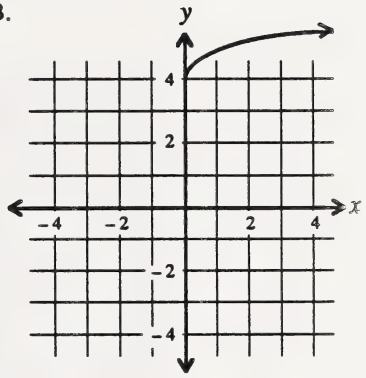

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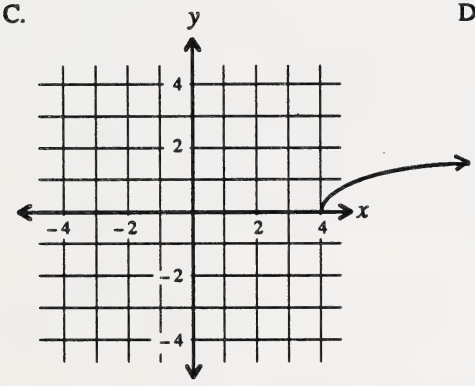

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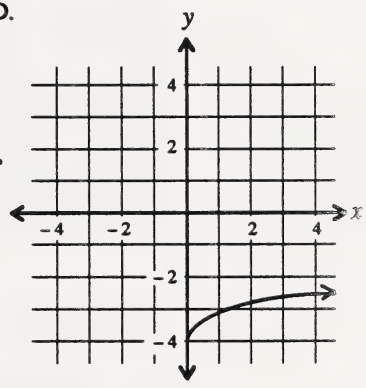
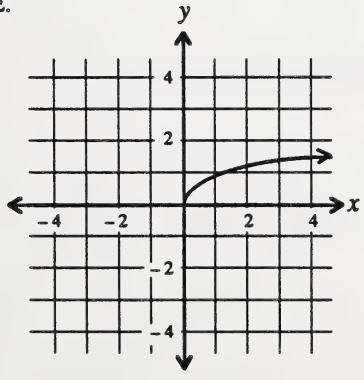


E.



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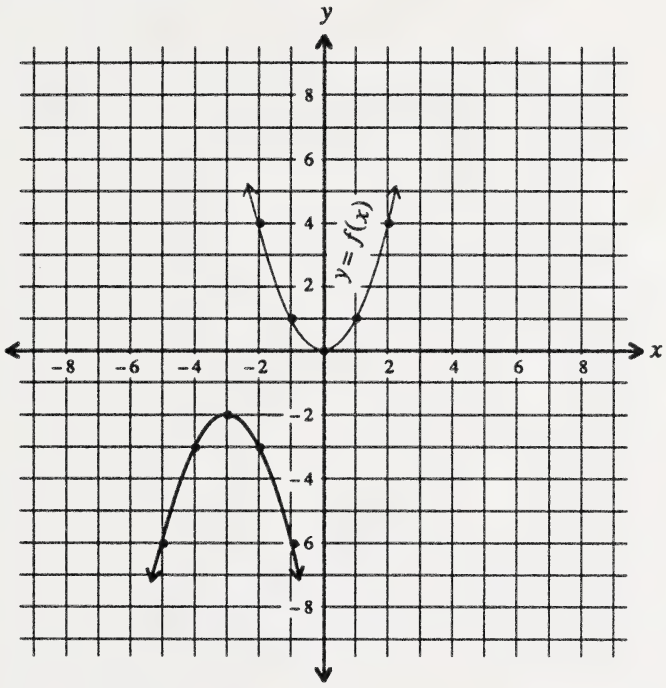
(4)

6. Write the new function that describes the transformation of $y = f(x)$ to the function shown.



The new function is _____ .

7. Write the new function that describes the following transformations.

(2) a. $y = (x-1)^3$ stretched vertically by a factor of 3

(2) b. $y = (x-1)^3$ compressed vertically by a factor of $\frac{1}{4}$ of the original

(2) c. $y = (x-1)^3$ reflected in the x-axis

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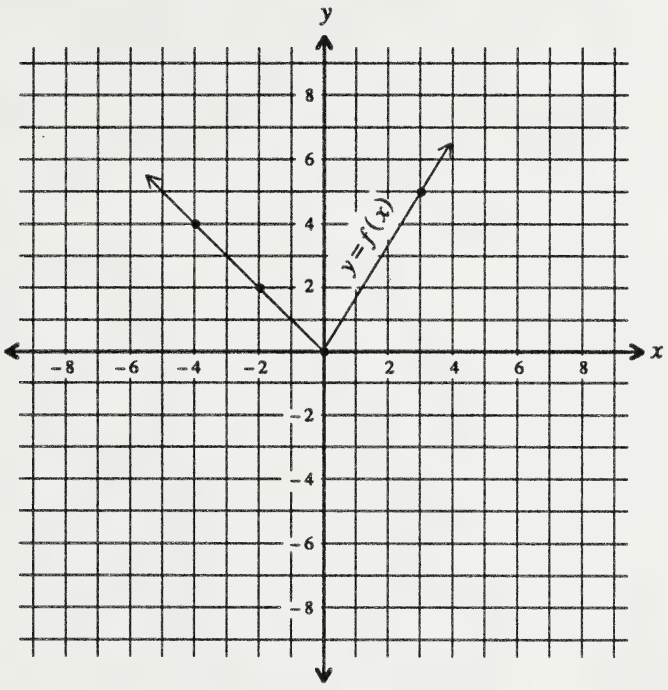
(2)

8. Draw the graph of $y = -f(x-2)$.



Topic 3

_____ marks

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